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10/658,709	09/08/2003	Kuo-Hsing Teng	67,200-1150	2302

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EXAMINER

BUEKER, RICHARD R

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 08/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/658,709

Applicant(s)

TENG ET AL.

Examiner

Richard Bueker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5,9-11,13 and 17-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,9-11,13 and 17-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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Claim 21 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 21 as written depends on itself.

Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 20, the phrase "the step of directing" lacks proper antecedent basis.

In claim 15, line 3, "pate" should be changed to "plate" to correct a typo.

Claims 1, 5 and 24 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Matsuka (5,520,857) (see figs. 5, 13 and 14, for example), who discloses a tank for generating vapor comprising a tank body for containing liquid to be vaporized and a nozzle assembly comprising a plurality of openings above the top surface of the liquid, the openings arranged for impacting a plurality of gas streams onto the top surface of the liquid. Matsuka's vaporizer is inherently capable of vaporizing a primer liquid. Also, it is noted that the attached dictionary definition of the word "impact" includes "2a: to have an impact upon: make contact with: impinge upon". Fig. 5 of Matsuka clearly illustrates that the plurality of gas streams are impacted onto the top surface of the liquid to be vaporized.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuka (5,520,857) taken in view of applicants' description of the prior art (Fig. 1). It would

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have been obvious to provide the vaporizer of Matsuka with a level sensor, because applicants' description of the prior art makes clear that level sensors were well-known in the art for monitoring the liquid level of a vaporizer.

Claims 1, 3, 5, 17, 18, 20 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda (5,733,375) taken in view of Matsuka (5,520,857) (Figs. 1-14) and in further view of Schmohl (2004/0146649). Fukuda (see Fig. 6) discloses a method of generating HMDS primer vapor comprising providing a primer tank and providing liquid primer in said tank to form an exposed surface of said liquid primer, said exposed surface comprising a liquid vapor interface. Nitrogen carrier gas is introduced into the space above the exposed surface by nozzle pipe 110, but Fukuda doesn't discuss the use of a plurality of gas streams of the nitrogen gas. Matsuka (see Figs. 1 and 4) also discloses the use of a vaporizer of the same type shown in Fig. 6 of Fukuda, in which carrier gas is introduced into the space above an exposed surface of a liquid to be vaporized. It is noted that applicants' Fig. 1 also illustrates the same type of vaporizer as shown in Fig. 6 of Fukuda and Figs. 1 and 4 of Matsuka. Matsuka (see Figs. 5, 13 and 14, for example) teaches that this type of vaporizer can be improved by supplying it with a primary gas stream that is divided into a plurality of gas streams according to a plurality of openings disposed above the top surface of the liquid. Fig. 5 of Matsuka clearly illustrates that the plurality of gas streams are impacted onto the top surface of the liquid to be vaporized. Matsuka teaches that his improved design desirably removes liquid droplets that collect on the ceiling of a vaporizer of the type illustrated in Fig. 6, of Fukuda, Fig. 1 of Matsuka and Fig. 1 of applicants' specification.

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Matsuka teaches that removing these droplets will improve the operation of the vaporizer. Therefore, it would have been obvious to modify the vaporizer of Fukuda by providing it with the nozzle assembly of Matsuka, to improve the operation of the vaporizer by removing droplets as taught by Matsuka. Also, Matsuka teaches that his vaporizer is particularly useful when the liquid to be vaporized is flammable and/or has a high vapor pressure. Fukuda teaches that HMDS is a flammable material. Also, Schmohl (paragraph 48) makes clear that HMDS was known in the prior art to have a particularly high vapor pressure. Therefore, one skilled in the art would have recognized that HMDS was a type of liquid that was particularly suitable for vaporization in the vaporizer of Matsuka.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda (5,733,375) taken in view of Matsuka (5,520,857) (Figs. 1-14) and in further view of Schmohl (2004/0146649) for the reasons stated above, and taken in further view of applicants' description of the prior art. At page 7, lines 17-22 of applicants' specification the operation of the prior art vaporizer illustrated in applicants' Fig. 1 is described as having carrier gas supplied "at a pressure of typically about 50 Kpa", which is 375 torr. It would have been obvious to one skilled in the art to operate a vaporizer of the type shown in Fig. 6 of Fukuda and Figs. 1, 5 and 13 of Matsuka at a pressure of less than atmospheric pressure because applicants teach that a sub-atmospheric pressure is typically used in this type of vaporizer.

Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda (5,733,375) taken in view of Yamaguchi (5,803,938) (Figs. 18 and 19 and col.

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27, line 44 to col. 28, line 23) or Martin (3,608,280) (Fig. 2). Yamaguchi and Martin teach the use of nozzle plates to supply gas to a vaporizer. It would have been obvious to use a nozzle plate in Fukuda's apparatus, because Yamaguchi and Martin teach that such a plate can be successfully used to supply gas to a vaporizer. The carrier gas ejected by the nozzle plates of Yamaguchi and Martin impinges onto an exposed surface of the liquid.

Claims 17-18, 22 and 23 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Fukuda (5,733,375). Fukuda (see Figs. 1-5) discloses a method of generating HMDS primer vapor comprising providing liquid primer in a primer tank and bubbling nitrogen gas through the liquid primer by creating a plurality of streams of nitrogen gas and impacting the plural streams onto an exposed surface of the liquid. A vapor that comprises nitrogen gas and vaporized primer forms above the top surface of the liquid primer, and is then transferred to a downstream process. Regarding the claim 17 recitation of "providing the liquid primer in said tank body to form an exposed surface of said liquid primer, said exposed surface comprising a liquid vapor interface", it is noted that such an exposed surface is formed (and a liquid vapor interface is also formed) in Fukuda's method at the point where the nitrogen gas exits the bubble generator 4 (see Fig. 3 of Fukuda, for example) and contacts (i.e. impacts) the liquid. It is also noted that the top surface of Fukuda's liquid also forms an exposed surface (and a liquid vapor interface), and the plurality of streams of nitrogen gas bubbles that pass through the liquid do impact the exposed top surface as required by claim 17.

Claims 1-3, 5, 9-11, 13, 24 and 25 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tomkins (6,561,498) (see Figs. 1-3, for example) who discloses a vaporizer comprising a liquid tank and a nozzle assembly comprising a gas inlet pipe for receiving a primary gas stream, a housing 11 (see Fig. 2) having a housing interior 10, and a nozzle plate 12, said nozzle plate having a plurality of nozzle openings for receiving the primary gas stream and ejecting a plurality of secondary gas streams onto an exposed surface of the liquid as required by claim 9. Also, the nozzle plate is arranged above the exposed surface of the liquid, as required by claims 2 and 13. It is noted that an exposed surface of liquid is formed at the lower outlet end of each nozzle 13. The vaporizer of Tomkins also has a liquid level sensor and a vapor outlet tube as recited in claims 3, 5, 10 and 11.

Claims 17-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomkins (6,561,498) in view of Fukuda (5,733,375). Tomkins teaches that his bubbler is for vaporizing materials that are conventionally vaporized in bubbler vaporizers. Fukuda teaches that HMDS primer is conventionally vaporized in a bubbler vaporizer, and therefore it would have been obvious to use Tomkins' vaporizer to vaporize HMDS.

Claims 1, 3, 5, 17, 18, 20 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda (5,733,375) taken in view of Coombs (1,336,070) and Brunner (545,048). Coombs and Brunner (545,048) both teach that a vaporizer of the type in which a carrier gas nozzle is located above the liquid surface can be provided with a nozzle assembly having a plurality of carrier gas outlets. The plural gas streams

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of Coombs and Brunner do impact the liquid surface. It would have been obvious to one skilled in the art to provide the vaporizer of Figs. 6 and 7 of Fukuda with a nozzle assembly having plural apertures, because Coombs and Brunner teach that a vaporizer with that type of nozzle assembly can successfully be used as a vapor source.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda (5,733,375) taken in view of Coombs (1,336,070) and Brunner (545,048) for the reasons stated above, and in further view of applicants' description of the prior art. At page 7, lines 17-22 of applicants' specification the operation of the prior art vaporizer illustrated in applicants' Fig. 1 is described as having carrier gas supplied "at a pressure of typically about 50 Kpa", which is 375 torr. It would have been obvious to one skilled in the art to operate a vaporizer of the type shown in Fig. 6 of Fukuda at a pressure of less than atmospheric pressure because applicants teach that a sub-atmospheric pressure is typically used in this type of vaporizer.

Claims 2, 9-11, 13 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda (5,733,375) taken in view of Coombs (1,336,070) and Brunner (545,048) for the reasons stated above, and taken in view of Tompkins (6,561,498). Coombs (Fig. 2) and Brunner (Figs. 1 and 2) teach the use of a nozzle assembly having a plenum and plural gas outlets, but they don't teach the use of a nozzle assembly having a plenum plate. Tompkins teaches that a plenum can be formed with a nozzle plate to successfully distribute a plurality of gas streams. It would have been obvious to provide a plenum gas distributor of the type taught by Coombs and Brunner in the form of a plate with plural openings because Tompkins teaches that

a plate shaped plenum can successfully be used to distribute carrier gas into plural streams in a vaporizer.

Applicants have argued that Fukuda does not teach "impacting an inert gas comprising a plurality of gas streams onto said exposed surface to form vapor above said liquid vapor interface". It is noted, however, that the location where the carrier gas of Fukuda impacts the liquid is an "exposed surface" as claimed, and is also a "liquid vapor interface", even if that location is below the top surface of the liquid.

Applicants have argued that Fukuda, Yamaguchi and Martin all disclose gas bubblers, which operate by a different principle of operation than applicants' invention. It is noted, however, that applicants' claims as written do not exclude bubbler type vaporizers, as discussed in the rejections above.

Regarding Matsuka, applicants have amended their claims to recite the plural gas streams "impacting" the liquid instead of being "directed" against the liquid. Applicants have argued that Matsuka's streams do not "impact" the liquid. First, it is noted that applicants' stated purpose for their invention is to reduce the impact of the gas on the liquid surface. At page 8, lines 9-14 of their specification, applicants' state that the purpose of their invention is "to reduce the energy of impact between the gas and the primer liquid and eliminate or at least reduce the formation of HMDS droplets in the tank" (emphasis added). Secondly, it is noted that the dictionary definition of the word "impact" (see attached dictionary definition) includes: "2a: to have an impact upon: make contact with: impinge upon". A word in a claim must be given its broadest reasonable interpretation. In this case, the broadest reasonable interpretation of

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"impact" is to "make contact with". This is in line with applicants' own disclosure, in which applicants state that their goal is to reduce the impact of the gas on the liquid. Regarding Matsuka, he illustrates (see Fig. 5 and col. 5, line 58 to col. 6, line 3) that his plural gas streams go down and contact the liquid surface, and thus the plural gas streams impact the surface of the liquid.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (571) 272-1431. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parvis Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Richard Bueker
Primary Examiner
Art Unit 1763